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FLORA OF PERU

BY

DOROTHY N. GIBSON

CUSTODIAN OF THE HERBARIUM

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BOTANICAL SERIES

FIELD MUSEUM OF NATURAL HISTORY

VOLUME XIII, PART V-A, NUMBER 2

NOVEMBER 10, 1967

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FLORA OF PERU

Dorothy N. Gibson

HYDROPHYLLACEAE. Waterleaf Family

References: Choisy, Mém. Soc. Phys. Gen. 6: 106. 1833 and in DC. Prodr. 10: 179. 1846. A. DC. Prodr. 9: 287 and 564. 1845. Lindl. Veg. Kingd. ed. 3: 638. 1853. Benth. & Hook. Gen. Pl. 2: 825. 1876. Peter in Engler & Prantl, Pflanzenf. 4(3a): 54–71. 1892. Brand in Engler, Pflanzenr. 4, 251: 1–210. 1913.

Plants usually herbaceous, sometimes suffruticose, annual or perennial, often pubescent, scabrid, glandular, and sometimes armed. Leaves alternate or opposite, sometimes rosulate, entire or pinnately- (rarely palmately-) divided. Inflorescences usually cymose, often helicoid, or may be reduced to a single flower; flowers bisexual, actinomorphic; calyx 5-lobed, imbricate; corolla 5-lobed, imbricate (rarely contorted), rotate, campanulate, or funnel-form; stamens usually 5, inserted on corolla tube near its base, alternate with corolla lobes, anthers bilocular, dehiscing longitudinally, filaments often basally dilated, sometimes subtended by appendages; ovary superior to half-inferior, usually unilocular with 2 parietal placentae meeting in the center, styles 1 or 2 (rarely 3), ovules 4 to many; fruit of 2 carpels, each 2 to many-seeded (occasionally 1-seeded due to abortion), dehiscing loculicidally, septicidally or rarely indehiscent; seeds variously rugose, reticulate or muricate; embryo small and straight; endosperm copious or thin, cartilaginous or fleshy.

Hydrophyllaceae are of almost world-wide distribution, having been reported from all continents except possibly Australia. Most of the genera are highly variable; cytogenetic studies of the family, such as those undertaken by Dr. Lincoln Constance and others in recent years will no doubt be a great help in delimiting taxonomic units.

The family is of little economic importance save for ornamentals. Four of the 20 genera occur in Peru.

Ovary bilocular ..... *Hydrolea*
Ovary unilocular
  Style 1 ..... *Phacelia*
  Styles 2

Plant seldom more than 30 cm. tall; herbaceous to partly woody, annual or perennial ..... *Nama*

Plant quite large, to several meters tall; suffruticose to arborescent, perennial ..... *Wigandia*

HYDROLEA L.

Erect, often branching, sometimes becoming decumbent, herbaceous to partly woody, usually glandular-pubescent, sometimes spiny in leaf-axils, annuals or perennials from taproots, usually in wet soil. Leaves alternate, entire, elliptical-lanceolate to obovate. Flowers usually few in lateral and/or terminal cymes; corolla usually blue, sometimes white, broadly campanulate, usually exceeding the calyx; calyx divided to base with lobes overlapping at base, persistent, accrescent; stamens included, inserted on tube, partly adnate at base, filaments dilated at base, anthers sagittate; styles 2 (rarely 3), elongating, with clavate-capitate stigmas; ovary superior, globose to nearly elliptic, bilocular, with 2 fleshy placentae containing numerous ovules; capsule globose to nearly elliptic, dehiscing irregularly, containing numerous, minute seeds.

The genus ranges from the southern United States through Mexico, Central and South America, the East and West Indies, and in Asia and Africa.

Sepals about equal to the mature, glabrous capsule
H. spinosa L. var. *inermis*

Sepals exceeding by 2–3 mm. the mature, pubescent capsule
H. zeylanica

H. spinosa L. var. **inermis** Spruce ex Bennett in Journ. Linn. Soc. 11: 271. 1869. *H. megapotamica* Spreng. Syst. 4. Cur. poster. 114. 1827. *H. spinosa* L. var. *megapotamica* (Spreng.) Brand in Engler, Pflanzenr. 4, 251: 182. 1913. *Wigandia herbacea* Choisy, Mém. Soc. Phys. Gen. 6: 117. 1833 and in DC. Prodr. 10: 184. 1846.

Erect herbs to 50 cm. tall, stem densely viscid-pilose, unarmed. Leaves sub-sessile or on short petioles, lanceolate to oblong-elliptic, acute, narrowed to the base, entire, usually 2–8 cm. long, glandular-pubescent on margins and along veins on under surfaces with scattered pubescence on upper surfaces; flowers usually short-peduncu-late, few in axillary and apparently sub-terminal cymes; corolla open-campanulate, blue, to 10 mm. long and 12–15 mm. across, exceeding the calyx by 2 or 3 mm.; calyx persistent, lobes ovate to

ovate-lanceolate, acute, glandular-pilose, 5–7 mm. long; stamens equalling or slightly longer than corolla, adnate near base of corolla tube, filaments dilated at base; ovary ovoid to nearly globose, glabrous; styles 2, elongating to 3 or 4 mm.; stigmas clavate-capitate; mature capsule globose, glabrous; seeds numerous, minute, light brown, rugose, longitudinally costate-undulate.

San Martín: Prov. Moyobamba, Rioja, 800 m., *Woytkowski 6096*; Loreto: *Ule 6567* (fide Brand).

Although the typical armed variety of *H. spinosa* L. may be expected in Peru as it and the var. *inermis* Spruce, both with varying degrees of pubescence, are fairly widespread throughout most of South America, the only two Peruvian specimens of the genus seen were unarmed.

H. zeylanica (L.) Vahl, Symb. Bot. 2: 46. 1791; Choisy in Mém. Soc. Phys. Gen. 6: 107. 1833 and in DC. Prodr. 10: 180. 1846; Walker-Arnott in Hook. Bot. Mag. 2: 193, *t. 26*. 1836; Wight, Icon. Pl. Ind. Orient. 2, *t. 601*. 1843; Bennett in Journ. Linn. Soc. 11: 275. 1869; Brand in Engler, Pflanzenr. 4, 251: 174. 1913. *Nama Zeylanica* L. Sp. Pl. ed. 1: 226. 1753 and ed. 2: 327. 1762. *Steris javana* L. Mant. Pl. 1: 54. S. 12(1). 1767. *Steris aquatica* Burm. Fl. Indica: 73, *t. 39, f. 3*. 1768. *Hydrolea javanica* Blume, Bijdrag. Fl. Nederl. Ind. 13: 725. 1825. *H. arayatensis* Blanco, Fl. Filipinas, ed. 1: 211. 1837; Merrill, Rev. Ident. Blanco 61. 1905.

Erect to decumbent herbs of wet soil, to 50 cm. tall, stem glabrous except for minute pubescence of extreme upper part, unarmed, leaves short-petioled, lanceolate to elliptic, entire, acute, glabrous, to 7 cm. long; flowers 2 to 7 in axillary and apparently sub-terminal cymes; pedicels and peduncles glandular-pubescent; corolla small, deep blue, broadly open-campanulate with petals becoming reflexed; calyx persistent, glandular-pubescent, lobes lanceolate, acute, equalling the corolla and exceeding the mature capsule by 2–3 mm.; stamens basally adnate to corolla tube, filaments dilated at base; ovary globose, glandular pubescent; styles 2, 1–1.5 mm. long; stigmas clavate-capitate; mature capsule globose, glandular-pubescent; seeds numerous, minute, rugose, longitudinally costate-undulate.

Peru: *Matthews 3046*.

NAMA L.

Erect to prostrate, simple or branched, herbaceous to partly woody, pubescent, often glandular annuals or perennials from slen-

der taproots. Leaves usually few, mostly alternate and entire, rarely dentate. Flowers single in axils of upper leaves or several in reduced lateral or terminal cymes; corolla white to purple, sometimes pubescent, tubular to funnel-form, exceeding the calyx; calyx divided nearly to base, the lobes linear-lanceolate to linear-spatulate, subequal, accrescent; stamens usually included, all basally adnate and unequally inserted on the corolla tube or may be unequal in length, filaments usually glabrous, their bases dilated or sometimes appendaged; styles 2, usually free but sometimes partially united, with small capitate stigmas. Ovary superior to semi-inferior, usually pubescent, unilocular but appearing bilocular due to the ingrowing parietal placentae. Capsule oblong to ovoid, cartilaginous, dehiscing loculicidally or septicidally, containing numerous brown, variously pitted, reticulate, or smooth seeds.

Of the species reported from South America, only one, *Nama dichotomum* (R. & P.) Choisy, was seen from Peru.[1] There is a broad-leaved form of *N. dichotomum* in Peru, Argentina and Bolivia, which Hitchcock (1933) separates as var. *amplifolium* (Brand) Hitchc., on the basis of the wider leaves and "spatulate calyx lobes" as opposed to linear-spatulate lobes of the typical variety. All specimens of this form which were examined had linear-spatulate calyx lobes and the leaf size was not constant. The specimen of *Bang 958* (Bolivia) on deposit in the Field Museum of Natural History, cited by Hitchcock as var. *amplifolium*, not only has linear calyx lobes, but only two leaves are slightly more than 4 mm. broad; all the remaining leaves are considerably less than 4 mm. As no other differences were found, this is considered to be a growth form or ecological variant of *N. dichotomum*.

Two additional annual species are known from the Andean regions of Argentina, Bolivia and Ecuador and might be expected to occur in Peru. *N. jamaicense* L. (introduced in South America?) is a slender plant with leaves usually broadly ovate, to 3.5 cm. wide, an almost tubular corolla to 7 mm. long, and an elongate ovary containing 50 to 70 light brown seeds. *Nama undulatum* HBK. is robust, branching from the base and with sessile cauline leaves; the corolla is 6–9 mm. long, and the capsule contains 100 to 180 yellow seeds.

Nama dichotomum (R. & P.) Choisy, Mém. Soc. Phys. Genève 6: 113. 1833; Gray, Proc. Am. Acad. 5: 338. 1861; Brand in Engler,

[1] Although *N. rupicola* Bonpl. ex Choisy, Mém. Soc. Phys. Genève 6: 114. (1833) is credited to Mexico and Peru, no South American specimens were seen, and it is felt that the Pavón collection referred to was probably from Mexico.

Pflanzenr. 4, 251: 150. 1913. *Hydrolea dichotoma* Ruiz & Pav. Fl. Peruv. 3: 22, *pl. 244, fig. b.* 1802. *N. tetrandra* Pavón ex Choisy, Mém. Soc. Phys. Genève 6: 113. 1833, *in synon.* *N. stricta* Phil. Fl. Atac. 37. 1860. *Marilaunidium strictum* (Phil.) Kuntze, Rev. Gen. Pl. 2: 434. 1891. *N. dichotomum* subsp. *eu-dichotomum* Brand in Engler, Pflanzenr. 4, 251: 151. 1913 (in part). *N. dichotomum* subsp. *eu-dichotomum* f. *stricta* (Phil.) Brand, l.c. 151, *fig. 28.* *N. dichotomum* var. *angustifolium* Gray, Proc. Am. Acad. 8: 284. 1870. *N. angustifolium* (Gray) A. Nels., Coult. and Nels. New Man. Rocky Mt. Bot. 410. 1909. *N. dichotomum* subsp. *angustifolium* (Gray) Brand in Engler, Pflanzenr. 4, 251: 151. 1913. *N. dichotomum* β *pauciflora* Choisy ex Gray, Proc. Am. Acad. 8: 284. 1870. *Conanthus angustifolius* (Gray) Heller, Bull. Torr. Bot. Club 24: 479. 1897. *Marilaunidium dichotomum* (R. & P.) Kuntze, Rev. Gen. Pl. 2: 434. 1891. *Marilaunidium tenue* Woot. & Standl. Contr. U. S. Nat. Herb. 16: 162. 1913. *N. dichotomum* var. *amplifolium* (Brand) Hitchc. Am. Journ. Bot. 20: 530. 1933.

Annual, slender, erect, simple or more or less dichotomously branched herbs, 4–30 cm. tall from a slender taproot, hirsute and glandular; leaves linear-spatulate to oblong-elliptic, 4–30 mm. long, 1–10 mm. wide, tapering to short petioles; flowers usually in pairs in leaf axils, sessile or on short pedicels; calyx lobes linear-spatulate, 2–5 mm. long in flower, to 10 mm. in fruit, hirsute-ciliate; corolla white to pale lavender, or white with blue or lavender lines, narrowly campanulate, to 5 mm. long; stamens unequally placed about 1 mm. from base of corolla, the glabrous filaments widened slightly just above the adnate base and with minute free margins along the adnate portions; styles to 2 mm. long; capsules pubescent, ovoid to oblong, containing 20 to 60 brown, minutely reticulate seeds about 0.5 mm. long.

Arequipa: Prov. Arequipa, cerros de Jesús, 2360 m., *Vargas 7937*; southern slopes of Chachani Mtn., 3660 m., *Hinkley 74*; quebrado de San Lázaro, 8500 ft., *Munz 15485*; Tingo, 2100–2300 m., *Pennell 13108*; Prov. Islai, Mollendo, *Hitchcock 22406.* —Cuzco: Prov. Calca, 2900 m., *Vargas 723*; Dist. Urubamba, Ollantaitambo, 3000–3100 m., *Pennell 13679.* —Huanuco: Prov. Ambo, about 7000 ft., *Macbride 3192.* —Junín: Prov. Huancayo, 3317 m., *Soukup 2959.* —La Libertad: Prov. Trujillo, Cerro Cabezón, 650 m., *López M. 0678.* —Lima: Prov. Cajatambo, Ambar, 2110 m., *Stork 11437*; Prov. Huarochiri, valley of Río Rimac, 1800 m., *Goodspeed & Metcalf 30246*, San Bartolomé, 1500–1600 m., *Weberbauer 5291*; Prov. Lima, Lurín, about

200 ft., *Macbride 5975*. —Moquegua: Prov. Moquegua, Lomas de Mostacilla, 50–300 m., *Vargas 8575*; Torata, 2200–2300 m., *Weberbauer 7409*. —Piura: Dist. Máncora, Amotape Hills, *Haught & Svenson 11550*. —Tacna: Prov. Tacna, Lomas cerca al Morro Sama, 500–600 m., *Ferreyra 12539*. In Ecuador, and to Bolivia, Chile and Argentina.

PHACELIA Juss.

Erect to decumbent, herbaceous, caulescent, branching, usually pubescent and often glandular annuals or perennials from taproots or creeping rootstocks. Cauline leaves usually alternate, entire, lobed, pinnatifid or pinnately dissected; basal leaves often rosulate. Flowers few to numerous in usually helicoid, raceme-like terminal cymes, long pedunculate to sessile; corolla blue, purple, pale lilac or white; narrowly to widely campanulate; calyx divided nearly to base, persistent, often accrescent; stamens usually exserted, all adnate and equidistant from the base of the corolla-tube; a pair of scales, wholly or partly adnate to tube, sometimes present at base of each filament; style bifid. Ovary unilocular with 2 linear placentae adherent to walls. Capsule ovoid, loculicidally dehiscent, containing 2 to many (usually 4) minutely rugose-aerolate seeds.

A widely distributed and variable genus, well represented throughout the Andes.

A considerable amount of work was done in an effort to find morphological characters consistent enough to be of use in classification of the so-called "*P. magellanica*" complex. A study of the scales at the base of the filaments proved them to be inconstant; investigation of the pubescence on the filaments revealed deviations in the flowers of single plants—one or two stamens in a flower are sometimes glabrous while the remainder show varying amounts of pubescence; plants with glabrous to slightly pubescent filaments occasionally have stamens exserted well beyond the 3 mm. specification used by Macbride (1917) to separate the typical variety of *P. magellanica* from the var. *robusta* (Brand) Macbride; pubescence of leaves and stems is equally variable. It is sometimes possible to separate certain Andean plants with glabrous to slightly pubescent filaments from those with filaments obviously to densely pubescent, in support of the separation of *P. secunda* Gmel. and its subspecies *pinnata* (R. & P.) Constance. However, other characters used by Macbride and by

Dundas[1] do not seem to be consistent; i.e., the basal leaves of both range from densely rosulate to not at all rosulate, and both exhibit stamens exserted at various lengths past the corollas. Therefore, in view of the fact that many specimens over a wide geographical range exhibit numerous variations and forms suggesting intergradation, we are treating this complex collectively as *P. secunda* Gmel., *sens. lat.*, until satisfactory taxonomic units may be delimited.

Leaves entire to pinnate; when pinnate, pinnules entire. *P. secunda*
Leaves pinnately lobed to lacerate and parted; margins of lobes or pinnules irregular and usually deeply crenate to dentate *P. pinnatifida*

Phacelia secunda J. F. Gmel. L. Syst. Nat. ed. 13, 2: 330. 1791. *Hydrophyllum magellanicum* Lam. Journ. Hist. Nat. 1: 373. 1792. *Heliotropium pinnatum* Vahl. Symb. Bot. 3; 21. 1794. *Aldea pinnata* Ruiz & Pav. Fl. Peruv. 2: 8, *t. 114, fig. a.* 1799. *P. circinnata* (Willd.) Jacq. f. Eclog. 1: 135, *t. 91.* 1816. *Hydrophyllum Aldea* Roem. & Schult. Sept. 4: 114. 1819. *P. magellanica* (Lam.) Cov. Contr. U. S. Nat. Herb. 4: 159. 1893. *Hydrophyllum magellanicum pinnatum* Macloskie. Rept. Princeton Patag. Exped. 8: 674. 1905. *P. magellanica* (Lam.) Cov. f. *amoena* Brand in Engler, Pflanzenr. 4, 251: 97. 1913. *P. magellanica* ssp. *barbata* f. *pinnata* Brand, *l.c.* 99. *P. pinnata* (R. & P.) Macbr. Contr. Gray Herb. 49: 37. 1917. *P. secunda* J. F. Gmel. ssp. *pinnata* (R. & P.) Const. Univ. Calif. Publ. Bot. 30(3): 241. 1959. *P. secunda* J. F. Gmel. ssp. *plantaginea* (Brand) Const., *l. c.*

Biennial or perennial, simple or branched, erect to semi-decumbent herbs, 4 cm. to 50 cm. tall from a taproot; more or less hirsute and appressed-hispid throughout, foliage usually appearing greyish-green; stem usually simple, more or less erect, additional shorter stems often arising near its base; lower leaves usually long-petioled and conspicuously veined, lanceolate, occasionally ovate, 1–10 cm. long, 0.5–3 cm. broad, entire or pinnate, rarely trilobate, the one or more pairs of lateral leaflets much smaller than the terminal; cauline leaves entire or pinnate, usually reduced upward; flowers numerous in dense racemose to corymbose, often somewhat capitate cymes, inflorescence elongating and spreading in fruit; calyx lobes lanceolate, 3–8 mm. or more long, hirsute-ciliate; corolla dingy-white, pink, blue-lavender to purple, 4–6 mm. or more long; stamens exserted, fila-

[1] Dundas, Frederick W. "A Revision of the Phacelia Californica Group (Hydrophyllaceae) for North America." Bull. So. Calif. Acad. Sci. 33: 152–178. 1935.

ments glabrous to pubescent, style well exserted, pubescent toward base; capsule pubescent, ovoid; seeds to about 0.4 mm. long, brown.

Ancash: Prov. Bolognesi, Matarragra, 3520–3560 m., *Ferreyra 5609;* San Isidro entre Chiquián y Aquia, 3000 m., *Ferreyra 7554.* —Arequipa: Prov. Arequipa, south slopes above Arequipa on trail to Sumbay, 3665 m., *Hutchison & Wright 7240;* Prov. Condesuyos, Chuquibamba, among rocks, 10,000 ft., *Stafford 1177.* —Ayacucho: Prov. Huancavelica, Orccon, near Conaica, 3550–3580 m., *Tovar 80.* —Cajamarca: Prov. Celendín, 12 km. east of Encañada on road from Cajamarca to Celendín, 3470 m., *Hutchison & Wright 5121.* —Chasqui: Prov. Huanuco, about 10,500 ft., *Macbride & Featherstone 1763.*—Cuzco: Prov. Cuzco, Chuco, 3300 m., *Vargas 135;* Prov. Cañas, slopes of San Andrés de Checca, 3860 m., *Vargas 11020;* Prov. Espinar, 4200 m., *Vargas 10544.* —La Libertad: Prov. Huamachuco, summit above Aricapampa on road to Huamachuco, 3970 m., *Hutchison & Wright 6262.* —Lima: Prov. Canta, bushy slopes of small canyon east of Canta, 3300–4100 m., *Pennell 14619;* Prov. Huarochiri, between Río Blanco and Chilca, 3650 m., *Hutchison & Tovar 4242;* between Lima and Oroya, 3300–3400 m., *Ferreyra 5292;* entre San Mateo y Casapalca, 3700 m., *Ferreyra 6513;* Matucana, steep slopes, 8000 ft., *Macbride 2939,* Viso, rocky grassy talus slopes, 9000 ft., *Macbride & Featherstone 639.* —Pomopampa: Prov. Ancash, Estación 30 miles east of Huaraz, about 12,000 ft., *Macbride & Featherstone 2497.* —Puno: Prov. Carabaya, cerca abra de antapampa, 4150 m., *Vargas 7003;* Prov. Lampa, Palmpa, Pucará, 4200 m., *Vargas 6401;* Prov. Puno, from mountainside near Lake Titicaca, 3125 m., *Shepard 42;* Prov. Sandía, along road from Cuyocuyo to summit, 3600 m., *Metcalf 30708.* To Bolivia, Chile and Argentina.

The annual *P. simplicifolia* Colla (*P. clinopodioides* Bertero) from Chile, with entire, simple to trilobate leaves, is readily distinguishable, as the stamens are always included in the tubular-campanulate corolla and the narrowly linear calyx lobes are more than twice as long as the capsule.

Phacelia pinnatifida Griseb. ex Wedd. Chlor. Andin. 2: 85. 1857. *P. pinnatifida β robusta* Wedd., *l.c.* *P. viscosa* Phil. Flor. Atacam. 37. 1860. *P. pinnatifida* var. *elatior* Griseb. Symb. Fl. Arg. 267. 1879. *P. pinnatifida* var. *lobulata* Hicken, Darwiniana 1: 134. 1924.

Biennial or perennial, erect, ascending, usually robust and often much branched, to 50 cm. tall from stout taproot, glandular-viscid, pilose and hirsute; leaves linear-oblong to oblong-elliptic, occasion-

ally to 16 cm. long, pinnately lobed to lacerate and parted, the margins of the lobes irregular and usually deeply crenate to dentate, subsessile to long petioled; flowers numerous in dense, usually racemose cymes, inflorescence elongating and often becoming strictly erect in fruit; calyx lobes linear to oblong-spatulate, obtuse, of unequal widths, to 7 mm. long or more, hirsute, considerably exceeding the capsule; corolla lavender, blue, or white with blue limb, 5–9 mm. long; stamens exserted, filaments glabrous; style exserted, hirsute directly above and below the bifurcation, may be cleft from only 1 mm. above ovary to nearly half its length; capsule ovoid, pubescent, 4–5 mm. long; seeds 2–3 mm. long, dark brown.

Arequipa: Prov. Camana, 4 km. from Caraveli on road to Atico, 1800–1900 m., *Metcalf 30343*. —Ayacucho: Prov. Huancavelica, Jupas-pata, arriba de Conaica, 3700–3750 m., *Tovar 245*; Prov. Lucanas, entre Puquio y Nauca, 3400–3500 m., *Ferreyra 5500*. —Cuzco: Prov. Calca, Pisac, 3200 m., *Vargas 5075*; Urubamba, open stony slopes surrounding town, 2900 m., *Vargas 2809*; valley of the Urubamba, 3300 m., *Weberbauer 6913*; Saxaihuanán, 3500 m., *Herrera 3116;* Prov. Cañas, Asunción Bridge, Apurimac River, rocky talus slopes, 3725 m., *Vargas 11035;* Prov. Canchis, Aguas Calientes, 4150 m., *Vargas 3325*. —Lima: Prov. Huarochiri, Viso, 9000 ft., *Macbride & Featherstone 764*. —Moquegua: Prov. Moquegua, between Moquegua and Torata, 1900 m., *Weberbauer 7425*. —Puno: Prov. Lampa, Andamarca, 13,300 ft., *Sharpe 50;* Prov. Puno, 4500 m., *Soukup 86*; vicinity of Lake Titicaca, 3125 m., *Shepard 146*; 3 km. from Chucuito on road to Puno, 4000 m., *Metcalf 30685*. Extending to Bolivia, Chile and Argentina.

P. nana Wedd. (*P. sinuata* Phil.; *P. villosa* Phil.), a perennial in Chile, Argentina and Bolivia, is similar in appearance to *P. pinnatifida*, but the stamens and style of *P. nana* are never exserted.

P. artemesioides Griseb., found in Chile, Argentina, Brazil and Uruguay, also closely resembles *P. pinnatifida* and may intergrade with it; the foliage of *P. artemesioides* is more finely dissected, the ultimate divisions sometimes appearing almost linear-filiform. Further, the calyx-lobes of the few specimens examined were considerably shorter than those of *P. pinnatifida*, exceeding the mature capsule by only about 1 mm. or not at all.

A third species, *P. cumingii* (Benth.) A. Gray, with foliage much like that of *P. artemesioides*, occurs in northern Chile and in Argentina. The stamens and style are always included; the style is united almost the entire length, being cleft only at the apex; and there are

usually 12 seeds instead of four as in *P. artemesioides* and *P. pinnatifida.*

WIGANDIA HBK.

Large, erect, suffruticose to arborescent perennials, variously pubescent (including stinging hairs) and glandular throughout. Leaves often quite large but variable in size from about 5–40 cm. long, and 3–24 cm. broad, coriaceous, net-veined, ovate-cordate, alternate, coarsely twice-dentate. Flowers few to many, sessile to sub-sessile, often appearing densely spicate, in terminal cymes or panicles; corolla greenish-white, yellow or lavender, open-campanulate, often partially pubescent, equal to or usually exceeding the calyx; calyx divided nearly to base, hispid-hirsute and ciliate, persistent, the lobes linear-lanceolate to lanceolate, acute, accrescent; stamens exserted, partly adnate to the base of the corolla tube, filaments usually pubescent, anthers linear-oblong, more or less sagittate, dorsifixed; styles 2, elongate, with capitate-clavate, depressed stigmas; ovary superior, oblong, pubescent, unilocular, with 2 laminiform placentae, the transverse portions of each meeting in the center, and with the numerous ovules borne chiefly along their revolute edges; capsule ovate-oblong, pubescent, dehiscing loculicidally or septicidally, and containing more than 200 minute, reticulate-rugose, brown seeds.

The genus is widely distributed, ranging from Mexico and Central America to Argentina, weedy, and so variable that I see no reason to change Sir Joseph Hooker's evaluation of the group of 1851[1] when, in connection with his studies of *W. caracasana* HBK., he said, ". . . it must be confessed that other species of *Wigandia* present great variations and intermediate gradations which render their claims to specific identity extremely doubtful."

Corolla to 50 mm. long, greenish white to pale yellow. . . . . *W. crispa*
Corolla to 18 mm. long, pale violet to purple. . . . . *W. urens*

Wigandia crispa (R. & P.) HBK. Nova Gen. & Sp. 3: 129. 1819; Choisy in Mém. Soc. Phys. Genève 6: 116. 1833 and in DC. Prodr. 10: 184. 1846. *Hydrolea crispa* Ruiz & Pav. Fl. Peruv. 3: 22, *t. 244.* 1802. *Wigandia pruritiva* Spreng. Syst. 1: 865. 1825. *Ernstamra crispa* (HBK.) O. Ktze. Rev. Gen. Pl. 2: 434. 1891. *W. reflexa* Brand in Engler, Pflanzenr. 4, 251: 135. 1913. "*W. urens* (L.) Urban," acc. Urban in Fedde Rep. Spec. Nov. fasc. 15: 415. 1919.

[1] Bot. Mag. ser. 3, 7: *t. 4575.* 1851.

Erect, suffruticose to arborescent plant to 6 m. tall; densely pubescent throughout, overlaid with hispid, often glandular and stinging hairs; leaves with 8 to 10 lateral veins, ovate, acute, subcordate to cordate at base, irregularly biserrate, appearing deep green above, greyish-white beneath, silky-pilose on both sides, usually noticeably hispid along primary veins; flowers subsessile to sessile in scorpioid, terminal panicles, corolla campanulate, greenish-white to pale yellow, silky-hirsute and sometimes glandular without, large, to 5 cm. long, exceeding the calyx by about 3 cm.; calyx persistent, lobes equal or subequal, lanceolate, acute, glandular-pilose and hispid-ciliate, to about 20 mm. long at anthesis, 30 mm. in fruit; stamens extending 7 to 10 mm. beyond sinuses but may be 4–7 mm. shorter than the corolla lobes, subequal, basally adnate to corolla tube, filaments pubescent at base but hairs soft and weak so that filaments may appear glabrous if examined without a lens; anthers appearing more sagittate than those of *W. urens*. Ovary ovate-oblong, silky-hirsute, styles to 30 mm. long, pubescent only at base; stigmas clavate-capitate; mature capsule oblong-ovoid, densely white-hirsute, exceeded by calyx lobes; seeds minute, reticulate-rugose, brown.

Junín: Prov. Tarma, 2000 m., *Constance & Tovar 3586*, Carpapata, above Huacapistana, 2400 m., *Killip & Smith 24363*. —Piura: Prov. Huancabamba, *Stork 11370;* Prov. Paita, Talara, *Haught 86*. Also in Ecuador.

Known locally as "mano de león."

Wigandia urens (R. & P.) HBK. Nova Gen. & Sp. 3: 127. 1819; Choisy, DC. Prodr. 10: 184. 1846, incorrectly as "*W. urens* (R. & P.) Choisy." *Hydrolea urens* Ruiz & Pav. Fl. Peruv. 3: 21, *t. 243*. 1802. *W. peruviana* W. Miller in Bailey, Cyclop. Am. Hort. 1975. 1902. *Ernstamra urens* (R. & P.) O. Ktze. Rev. Gen. Pl. 2: 434. 1891.

Erect, branching, robust, suffruticose plant, to 4 m. tall, densely sordid with white hispid to bristly-hirsute, sometimes glandular and often stinging hairs; leaves with 5 to 7 lateral veins, ovate, obtuse to sub-acute at apex, cordate to truncate at base, irregularly biserrate, appressed pilose on upper surface and white-tomentose underneath; flowers subsessile to sessile in dense scorpioid terminal cymes or panicles, corolla campanulate, pale violet to purple, lighter in throat, silky pilose to tomentose without, to 18 mm. long, equalling or slightly exceeding the calyx; calyx persistent, lobes subequal, acutely linear-lanceolate, tomentose and hispid-ciliate, about equal to the mature capsule; stamens included, subequal, filaments retrorsely hispid from

base to more than half to nearly two-thirds their length, basally adnate to corolla tube. Ovary ovate-oblong, silky to hispid-hirsute, styles 10–15 mm. long, pilose to more than one-third their length; stigmas clavate-capitate; capsule oblong-conical, hispid-hirsute; seeds numerous, minute, reticulate-rugose, brown.

Canta: Prov. Canta, Obrajillo, *Wilkes Expedition*. —La Libertad: Chicama Valley, *Smyth 72*. —Lima: Prov. Canta, 1700–1800 m., *Ferreyra 7261;* Prov. Huarochiri, Matucana, 8000 ft., *Macbride & Featherstone 290*; Olivo, 1140 m., *Stadelman 2*; Valley of Río Rimac, 1900 m., *Constance & Tovar 3583*; Ruinas de Cajamarquilla, 300–400 m., *Ferreyra 2857*. To Colombia and Ecuador.

Known locally as "Tabaquillo."

Wigandia caracasana HBK., found in Colombia and Venezuela and which may be expected in Peru, I believe to be a form or variety of *W. urens*, as the only distinguishing character appears to be its constant short and velvety pubescence as opposed to the longer, hispid pubescence of *W. urens*. The "channelled" petioles of *W. caracasana* are also found in the other species; although it is true that the calyx lobes of specimens identified as *W. caracasana* are sometimes shorter than the mature capsule, they are also sometimes equal to and may even exceed the capsule.

POLEMONIACEAE. Phlox Family

REFERENCES: Benth. in DC. Prodr. 9: 302–322. 1845. Benth. & Hook., Gen. Pl. 2: 820–824. 1876. Peter in Engl. & Prantl, Pflanzenf. 4(3a): 40–54. 1891. Brand in Engl. Pflanzenr. 4, 250: 1–203. 1907. Wherry, A provisional key to the Polemoniaceae. Bartonia 20: 14–17. 1940. Grant, Natural History of the Phlox Family. 1: 1–273. 1959.

Plants usually herbaceous annuals or perennials, a few climbing shrubs or small trees, usually somewhat pubescent, sometimes glandular. Leaves alternate (lower ones sometimes opposite), entire, serrate, or pinnately divided. Inflorescences usually cymose, the flowers rarely solitary and axillary; flowers bisexual, actinomorphic or weakly zygomorphic. Calyx 5-lobed, imbricate or valvate, persistent, accrescent to subaccrescent; corolla tubular (campanulate in *Cobaea*), 5-lobed, lobes contorted, salverform to rotate; stamens 5, inserted on corolla tube at various, often unequal heights, anthers bilocular, introrse. Ovary superior, inserted on disc, trilocular (rarely 2 or 5 carpels), placentation axile, ovules 1–many on each placenta, style filiform, stigmatic branches 3 (rarely 2 or 5); fruit a capsule

dehiscing loculicidally (septicidally in *Cobaea*) or rarely indehiscent; seeds usually many but may be only 1 or 2 in each locule, usually small, more or less angular, sometimes winged. Embryo spatulate; endosperm usually firm, abundant.

The Polemoniaceae are naturally distributed throughout North and South America and Eurasia. They occur as weeds in Africa and Australia. Of the 317 reported species, 27 occur in South America; five genera are presently known from Peru. The family is economically important for the ornamentals *Cantua, Cobaea, Gilia, Linanthus, Phlox* and *Polemonium.*

Plants herbaceous annuals or perennials
- Leaves dissected, incised or lobed ..... *Gilia*
- Leaves entire or serrate ..... *Phlox*

Plants suffrutescent or woody
- Plants lianas, terminal leaflets modified to tendrils ..... *Cobaea*
- Plants small trees or shrubs
  - Leaves simple; capsule longer than calyx ..... *Cantua*
  - Leaves pinnately divided; capsule shorter than calyx .... *Huthia*

CANTUA Juss. ex Lam.

Erect, branching shrubs (rarely becoming small trees), the branches cylindrical, grooved to warty, usually at least partly pubescent. Leaves coriaceous to subcoriaceous, alternate or fasciculate, entire to sinuate-dentate; petioles short and usually pubescent; the caducous juvenile leaves toothed and usually considerably larger than adult leaves; adult leaves of all but two species nearly always entire —rarely a few teeth appear; flowers usually few to many in terminal corymbs, rarely solitary; corolla often rose to purple but may be white, pink, yellow, greenish, or the tube may be white or yellow with lobes yellow to purple; variously colored striations also occur; corolla tubular to funnelform or salverform, often twice to three times as long as the calyx, apex of corolla lobes from deeply bilobate through retuse, retuse-apiculate, apiculate or even truncate-erose; calyx purple to green, persistent, accrescent, tubular to cup-shaped or campanulate, more or less zygomorphic, 3–5 (6) -lobed, lobes acute, sometimes acuminate, one or all may be bifid, 2 lobes sometimes divided to base so that calyx appears bilabiate; stamens included to long exserted, partly adnate to and inserted on tube from very near the base to a point one-fourth of the corolla length above the base,

filaments usually glabrous (rarely pubescent near or above point of insertion), anthers versatile, sagittate or reniform; style filiform, included or exserted, stigma 3-parted, branched or lobed; disc irregularly 5-lobed; ovary superior, glabrous, ovoid to oblong-ovoid, tricarpellate, trilocular with numerous ovules in each locule; mature capsule oblong, glabrous, dehiscing loculicidally by 3 valves, containing numerous small, broadly-winged seeds.

The genus is South American, ranging through the Andean region from Ecuador through Bolivia, Chile and to Brazil. All species are variously known locally as "Ccantu," "Kantuta," "Decanto," "Ccellmo," "Flor del Inca," "Inca-Panccara," "Esfirna" and "Chalagantu." *C. candelilla* is also known as "Candelilla"; *C. flexuosa* is sometimes called "Turu," and *C. quercifolia* is known as "Pipiso" or "Pepiso."

Leaves all obviously sinuate-crenate ..... *C. quercifolia*
Leaves entire to somewhat dentate
  Calyx cup-shaped to campanulate, not more than 1.5 cm. long
    Adult leaves 8–16 cm. long, 4–6 cm. wide ..... *C. longifolia*
    Adult leaves usually less than 8 cm. long; never more than 10 cm. long and 4 cm. wide
      Corolla greenish-yellow, 2.5–3 cm. long, lobes usually apiculate ..... *C. pyrifolia*
      Corolla white, 2–2.5 cm. long, lobes retuse to deeply cleft *C. flexuosa*
  Calyx tubular to tubular-campanulate, 1.6–3.2 cm. long
    Apex of expanded corolla truncate ..... *C. candelilla*
    Apex of expanded corolla not truncate
      Corolla 4–5 cm. long ..... *C. cuzcoensis*
      Corolla 5.5–8 cm. long ..... *C. buxifolia*

C. bicolor Lemaire is omitted as there is no reason to believe that it occurs in Peru. The single Peruvian specimen, *Soukup 363*, cited by Infantes Vera[1] has terminal and sub-terminal corymbose inflorescences of several flowers, with corollas to 6 cm. long, and is *C. buxifolia* Juss. According to her own description[1] of *C. bicolor*, as well as those of Lemaire,[2] Paxton,[3] Hooker,[4] and Brand,[5] the inflorescences

[1] Lilloa 31: 91. 1962.
[2] Fl. des serres, sér. 1, 3: 242. 1847.
[3] Mag. Bot. 15: 219. 1849.
[4] Bot. Mag. ser. 3, 9: *t. 4729*. 1853.
[5] Engler, Pflanzenr. 4, 250: 23. 1907.

consist of solitary flowers, each borne singly in leaf axils, with corollas of only 4–5 cm. in length. This description fits *Fiebrig 2155* from southern Bolivia (Dept. Tarija, Prov. Arce, Huayavilla).

Cantua buxifolia Juss. ex Lam. Dict. Encycl. Bot. 1: 603. 1785; Illustr. 1: *t. 106, f. 2.* 1823. Juss. Ann. Mus. Hist. Nat. Paris 3: 118, *t. 8.* 1804; D. Don, Edinb. Phil. Journ. 7: 290. 1822; Benth. in DC. Prodr. 9: 321. 1845; Hook. in Bot. Mag. *t. 4582.* 1851; Lemaire, Jard. Fleur. 2: *t. 115.* 1852; Peter in Engler & Prantl, Pflanzenf. 4, 3a: 45. 1891; Brand in Engler, Pflanzenr. 270: 22. 1907; Infantes Vera, Lilloa 31: 84. 1962. *C. ovata* Cav. Icon. 4: 43, *t. 363.* 1797; Poiret in Lam. Encycl. Méth. Suppl. 2: 79. 1811; Roem. & Schult. Syst. 4: 366. 1819; Benth. in DC. Prodr. 9: 321. 1845. *C. tomentosa* Cav. Icon. 4: 43, *t. 364.* 1797; Persoon, Syn. Pl. 1: 187. 1805. *C. dependens* Pers. Syn. Pl. 1: 187. 1805. *C. uniflora* Pers. Syn. Pl. 1: 187. 1805. *C. theaefolia* Don, Edinb. Phil. Journ. 7: 289. 1822. *C. lanceolata* Peter in Engler & Prantl, Pflanzenf. 4, 3a: 45. 1891. *C. buxifolia* Juss. var. *lanceolata* (Peter) Brand in Engler, Pflanzenr. 270: 22. 1907. *C. buxifolia* Juss. var. *ovata* (Cav.) Brand in Engler, Pflanzenr. 270: 22. 1907. *C. alutacea* Infantes Vera, Lilloa 31: 88. 1962. *Periphragmos dependens* Ruiz & Pavón, Fl. Peruv. 2: 18, *t. 133,* 1799. *P. uniflorus* Ruiz & Pavón, Fl. Peruv. 2: 18. 1799.

Erect, branching shrub or small tree, to 5 m. tall, more or less pubescent throughout, although degree of pubescence quite variable, glabrescent in part. Leaves ranging in size from only 0.6 cm. to nearly 4 cm. long, sessile to short-petioled, usually elliptic but may be obovate, oblanceolate, or linear-oblanceolate, acute, tapering to base, usually entire, rarely irregularly dentate toward apex; inflorescence of few to many flowers on pedicels of varying lengths, in usually lax terminal corymbs, rarely reduced to a solitary flower; corolla funnelform, usually rose to purple but may be white, yellow, or the tube yellow with lobes white or rose, 5.5–8 cm. long, the lobes bilobate, retuse-apiculate or rounded and irregularly dentate; calyx tubular or tubular-campanulate, 1.6–3.2 cm. long, lobes unequal, triangular, acute, rarely acuminate, nearly glabrous to heavily pubescent, sometimes glandular, usually more pubescent at base and at apex of lobes, inside as well as outside; stamens exserted or included, adnate to tube at a point about 1–1.5 cm. from its base; ovary pyriform to oblong, to 12 mm. long, glabrous; style usually exserted, rarely included, to 9 cm. long; mature capsule oblong, to 2.5 cm. long, usually containing 20–30 winged seeds, each 8–12 mm. long.

Without locality: *Mathews 485* (1834); *Lechler 1936* (only fragments seen, along with FM photograph No. 27054); FM photograph No. 14025, of *Ruiz* collection, without number or date. —Ancash: Valley Santal, 3400 m., *Rauh & Hirsch P2106*; Prov. Bolognesi, Callapata, 3850 m., *Ferreyra 5804*; Chupa, 3200 m., *Ferreyra 7543*. —Arequipa: Prov. Arequipa, *Rose 18978*. —Apurimac: Prov. Andahuailas, Argama, 3300 m., *West 3748*; 2500 m., *Stork & Horton 10727*; Prov. Apurimac, south of Chincheros, 3200 m., *West 3688*. —Ayacucho: Prov. Parinacochas, Coracora, 2900 m., *Weberbauer 5790*; Valley of Río de Ocoña, above Calpamayo, 3650 m., *Weberbauer 7177*. —Cuzco: Prov. Cuzco, 3400 m., *Ferreyra 2651*; 3600 m., *Herrera 1192*. —Huanuco: Prov. Llata, 7000 ft., *Macbride & Featherstone 2292;* Prov. Dos de Mayo, Chavinillo, 8000 ft., *Macbride & Featherstone 1977*. —Junín: Prov. Ambo, Chasqui, 10,500 ft., *Macbride & Featherstone 1908;* Prov. Cerro de Pasco, Ambo, 3200 m., *Seibert 2204;* Prov. Jauja, 3300 m., *Ochoa 108;* Prov. Tarma, 3300–3500 m., *Ferreyra 3786*; 10,600 ft., *Saunders 539*, 3500 m., *Constance & Tovar 2369, 2397*. —Lima: Prov. Huarochirí, Obrajillo, *Née* (July, 1802), Río Blanco, 3500 m., *Hutchison 579*; San Mateo, 3200 m., *Asplund 11492*; 11,500 ft., *Saunders 323*; Viso, 9000 ft., *Macbride & Featherstone 640*. —Puno: Prov. Huancaré, Umuchi, 3125 m., *Shepard 103*; Ushopata Valley, 3700 m., *Cook & Gilbert 127;* Prov. Sandía, Limbani, 3200 m., *Vargas 1284*. Also in Bolivia.

Dra. Infantes Vera retained as separate species *C. ovata* Cav. and *C. tomentosa* Cav., and created a third, *C. alutacea* Infantes. Every effort was made to find one or more characters that could be relied upon to distinguish each of these from *C. buxifolia* Juss., without success. In the case of *C. ovata* Cav., the original plate and description indicates flowers with apiculate corolla lobes, solitary in leaf axils, leaves ovate-oblong, stamens exserted. *Periphragmos uniflorus* Ruiz & Pavón, which Infantes agrees is synonymous with *C. ovata*, is also described as having flowers borne singly in leaf axils, with stamens exserted. Bentham states in part, "*. . . floribus laxa subcorymbosis v. in axillis superioribus solitariis. . . .*" Infantes describes the inflorescences as "*. . . pauci o multiflores, a veces flores solitarias, nacen en la axila de una hoja. . . .*" and the corolla lobes as "*. . . enteros o bilobados . . ., mucronados, . . . pubescentes en los bordes.*" However, no pubescence was found on corolla lobes of any of the specimens which she cited and the lobes were not mucronate. A Field Museum photograph of a Ruiz collection identified by Brand as *C. buxifolia* var. *ovata* shows no flowers, but two leafy stems, obvi-

ously in the juvenile phase with ovate leaves and occasional, irregular dentation toward the apices.

Although I was unable to see any of the specimens cited by Infantes as *C. tomentosa*, I did examine fragments of *Lechler 1936*, cited by Brand as the type of his *C. buxifolia* var. *lanceolata*, which Infantes places in synonymy with *C. tomentosa*. The two calyces and one leaf which were examined are not tomentose; in fact, they are not as pubescent as are other specimens cited by her as *C. buxifolia*, i.e., *Macbride & Featherstone 1069*. Further, the single seed in the packet of fragments is in no way different from those of *C. buxifolia*.

Her *C. alutacea*, with flowers described as white to yellowish, is at best a color form of *C. buxifolia;* seeds of *Herrera 2198* cited as *C. alutacea* are identical with those of *C. buxifolia*, the apex of the wing being irregular but not bilobate, and the seed measurement 9 mm. rather than 7 mm. One might be able to separate *C. alutacea* from *C. buxifolia* by reading color notes on the labels if it were not for the fact that *Vargas 1284* was cited as *C. alutacea*, and his label reads, "rojo y amarillo."

Cantua candelilla Brand in Engler, Pflanzenr. 4, 250: 22. 1907; Infantes Vera, Lilloa 31: 95. 1962.

Erect, branching shrub or small tree to 4 m. tall, more or less pubescent throughout. Leaves usually quite small but occasionally to 3 cm. by 0.9 cm. wide, sessile to short-petioled, linear-oblanceolate to oblanceolate-ovate, acute, tapering to base, usually entire, rarely irregularly dentate toward apex, pubescent on both sides; flowers on pedicels of varying lengths in terminal, usually lax corymbs; corolla orange-pink to scarlet, 5–8 cm. long, incurved, often narrowing below middle of tube, truncate at apex, occasionally very minutely pubescent on the exterior at a point just below the lobes, the lobes retuse-apiculate;[1] calyx tubular, glandular-pubescent (heaviest pubescence often at apex of lobes, inside as well as without), 1.6–2.7 cm. long; stamens usually well exserted,[2] often exceeding the corolla by as much as 1.5 cm., adnate to tube at a point about one-fifth above its base, filaments sometimes pubescent at point of insertion; ovary oblong-ovoid, glabrous; style exserted, exceeding the tube by as little

[1] One exception, *Hutchison 1252* (Dept. Ayacucho, Prov. Lucanas) was seen, in which the retuse lobes usually lacked an apiculum. As the corolla limbs of this collection were also more widely expanded than is usual in *C. candelilla*, this may be a hybrid.

[2] Stamens of all specimens seen were exserted to some degree with the exception of *Weberbauer 7287a*.

as 0.2 cm. to as much as 2.8 cm.; mature capsule oblong-ovoid, glabrous, not more than 2 cm. long, about equal to or scarcely exceeded by the calyx lobes; seeds brown, elliptic, winged, 6–8 mm. long.

Arequipa: Prov. Arequipa, 3200–3600 m., phototype, F. M. Neg. No. 14024, of *Weberbauer 1428*; Chachani, 3300 m., *Rauh & Hirsch P523*; 3600–3700 m., *Pennell 13264*; 11,000 ft., *Stafford 610*. —Moquegua: Prov. Moquegua, Carumas, 3200 m., *Weberbauer 7266* and *7287-a*. —Tacna: Prov. Tarata, 2800 m., *Metcalf 30363*; 3840 m., *Pearson 32*; Tarata Libre, Candarave, 3600 m., *Weberbauer 7371*.

Cantua cuzcoensis Infantes Vera, Lilloa 31: 102. 1962.

Erect, branching shrub or small tree to 5 m., of variable pubescence.[1] Leaves sessile to short-petioled, to 3.8 cm. long and 1.1 cm. wide, oblanceolate to elliptic, acute, tapering to base, usually entire but occasionally with a few teeth unequally placed toward apex, usually with some pubescence at least along midvein and/or near base; inflorescence of many-flowered, terminal corymbs, flowers borne on pedicels of vaying lengths (not more than 15 mm.); corolla 4-5 cm. long, usually pink to crimson (tube sometimes cream or yellowish tinged with pink), tubular with spreading lobes when completely expanded, apex of lobes shallowly and unevenly cleft, borders of lobes minutely ciliate to pilose; calyx tubular-campanulate, 1.6–2 cm. long, lobes triangular and acute, pubescence usually minute and scattered, heavier near base and at apex of lobes; stamens usually well exserted,[2] sometimes exceeding the corolla by as much as 1.8 cm., inserted about 4–5 mm. above base of tube; ovary oblong, to 12 mm. long, glabrous; style exserted, to 6 cm. long; mature capsule oblong, to 14 mm. long, usually containing 17–21 winged seeds.

Apurimac: Prov. Abancai, 11,000 ft., *Balls B6903;* Prov. Andahuaylas, 2500 m., *Stork & Horton 10729*. —Cuzco: Without locality, *Gay* (Oct. 1839–Feb. 1840); Prov. Calca, 3150 m., *Vargas 215*; 3050 m., *Vargas 9785*. —Junín: Prov. Huancayo, Quebrada Occopilla, 3345 m., *Soukup 3627*.

Cantua flexuosa (R. & P.) Pers. Syn. Pl. 1: 187. 1805; Infantes Vera, Lilloa 31: 104. 1962. *Periphragmos flexuosus* Ruiz & Pavón, Fl. Peruv. 2: 17, *t. 131*. 1799.

[1] Without a lens, this species often appears glabrous.

[2] Stamens were well exserted on all specimens seen except *Soukup 3627*, cited by Infantes Vera in her original description but all other characters match the description.

Erect, branching shrub or small tree, occasionally to 5 m. tall, always somewhat pubescent, although degree of pubescence variable. Leaves rarely to 9 cm. long and 3.6 cm. wide but averaging about 4 by 1.7 cm., short-petioled, elliptic, lanceolate to ovate, acute, tapering to base, usually entire but occasionally with a few teeth toward apex, usually somewhat pubescent, at least on underside along midvein; flowers on pedicels of varying lengths, usually crowded in dense, terminal or sub-terminal corymbs; corolla campanulate, somewhat incurved, white, 1.5–2.3 cm. long, exceeding the calyx by 1–1.5 cm., tube sometimes pubescent on upper part, corolla lobes retuse to deeply cleft, borders of lobes minutely ciliate to nearly pilose; calyx 0.8–1.5 cm. long, campanulate, minutely pubescent with heavier pubescence at base and on tips of lobes, lobes triangular, unequal; stamens exserted, exceeding the corolla by 1–1.5 cm., adnate to tube at a point only 1 or 2 mm. above base; ovary oblong-ovoid, glabrous; style exserted, to 4 cm. long; mature capsule oblong-ovoid, glabrous, to 2.5 cm. long, at least twice as long as the calyx; seeds numerous, brown, winged, oblong to ovate, to 9 mm. long.

Apurimac: Prov. Abancai, Tilca, 2800 m., *Rauh & Hirsch P1540*; 3050 m., *Vargas 1972*. —Ayacucho: Prov. Huanta, Parcora, 3000 m., *Killip & Smith 22182*; Prov. La Mar, 3100–3200 m., *Weberbauer 5554*. —Cuzco: Prov. Anta, 3100 m., *Vargas 7281*; Prov. Calca, 3200 m., *Marín 2399*; Prov. Paruro, 3200 m., *Vargas 442*; Prov. Paucartambo, 3000 m., *Vargas 11184*. —Huancavalica: Prov. Huancavalica, 2400 m., *Stork & Horton 10895*; Prov. Tayacaja, 3250 m., *Stork & Horton 10262*. —Huanuco: Type collection, without locality, *Ruiz & Pavón*; Prov. Ambo, 2800 m., *Seibert 2215*; Prov. Huanuco, Dunkafail, *Sawada P75*; Muña, 7000 ft., *Macbride 3923*; 8000 ft., *Pearce* (May, 1863); Yanahuanca, 10,000 ft., *Macbride & Featherstone 1182*. —Junín: Prov. Cerro de Pasco, Huariaca, 3200 m., *Asplund 11967*; 7000 ft., *Sandeman* (June, 1938); Prov. Jauja, Mito, 9000 ft., *Macbride & Featherstone 1565*. —Lima: Prov. Lima, *Rose 18633*. —San Martín: Prov. San Martín, Uspayaca, 8500 ft., *Macbride & Featherstone 1292*. Also in Bolivia.

Cantua longifolia Brand, Fedde Rep. Spec. Nov. 20: 46. 1924; Infantes Vera, Lilloa 31: 83. 1962.

Erect, branching shrub, to 6 m. or perhaps taller, somewhat pubescent throughout except on larger stems, probably becoming glabrescent with age. Leaves 8–16 cm. long, 4–6 cm. wide, short-petioled, elliptic to obovate, acute, tapering to base, with 7–20 teeth on the upper two-thirds of the leaf margins; flowers borne on pedicels of

varying lengths (1–5 cm.) in lax, terminal corymbs; corolla greenish-yellow, funnelform, 2–2.5 cm. long, exceeding the calyx by 1–1.5 cm., with some scattered pubescence on upper part of tube, lobes irregularly bilobate; calyx cup-shaped to campanulate, to 1.3 cm. long, minutely pubescent, lobes triangular, unequal; stamens exserted, exceeding the corolla by 1–1.5 cm., adnate to tube at a point 5–12 mm. above the base; ovary oblong-ovoid, glabrous; style exserted, to 3 cm. long, mature capsule oblong, glabrous, to 2.5 cm., about twice as long as the calyx; seeds numerous, brown, winged, suborbicular to pyriform, to 4 mm. long.

Libertad: Prov. Pataz, 2600 m., *Weberbauer 7038*[1] *and 7039*. —Without locality: *Ruiz & Pavón* (1778–1788).

Cantua pyrifolia Juss. ex Lam. Encycl. Méth. 1: 603. 1783; Illust. 1, *t. 106, f. 1*. 1791; Willd. Sp. Pl. 1(2): 879. 1797; Juss. in Ann. Mus. Paris 3: 117, *t. 7*. 1804; HBK. Nova Gen. & Sp. 3: 161. 1818; Benth. in DC. Prodr. 9: 320. 1845; Hook. Bot. Mag. 74: *t. 4386*. 1848; Lemaire, Fl. des serres 4: *t. 383*. 1848; Infantes Vera, Lilloa 31: 97. 1962. *C. peruviana* Gmel. Syst. 347. 1791. *C. loxensis* Willd. in Roem. & Schult. Syst. Veg. 4: 369. 1819. *C. ochroleuca* Brand in Engler, Pflanzenr. 4, 250: 23. 1907.

Erect, branching shrub or small tree to 6 m. tall, always somewhat pubescent, although degree of pubescence is quite variable. Leaves 3–10 cm. long, 1.5–4 cm. wide, short-petioled, elliptic to obovate, acute, tapering to base, usually entire but occasionally with a few teeth toward apex, usually somewhat pubescent, at least on underside along mid-vein; flowers borne on pedicels of varying lengths, in lax, terminal corymbs; corolla funnelform, greenish-yellow, 2.5–3 cm. long, exceeding the calyx by 1–1.5 cm., tube often pubescent, lobes usually apiculate but rarely somewhat retuse, borders of corolla lobes minutely ciliate; calyx about 7 mm. to not more than 1.5 cm. long, cup-shaped to campanulate, minutely pubescent, lobes triangular; stamens exserted, exceeding the corolla by at least 1 cm., adnate to tube at a point 4–9 mm. above base, filaments often pubescent at point just above insertion; ovary oblong-ovoid, glabrous; style exserted, to 3.5 cm. long; mature capsule oblong, glabrous, at least twice as long as the calyx; seeds numerous, brown, winged, pyriform to elliptic, to 6 mm. long.

[1] The specimens cited by Brand, in the Berlin Herbarium, are presumed destroyed; duplicate specimen of *Weberbauer 7038*, in the Field Museum Herbarium, is here designated as lectotype.

Amazonas: Prov. Bongará, 2400 m., *Wurdack 977*; Prov. Chachapoyas, *Mathews 3046*. Also in Ecuador.

Cantua quercifolia Juss. Ann. Mus. Hist. Nat. Paris 3: 118. 1804; Poiret in Lam. Encycl. Méth. Suppl. 2: 80. 1811; Benth. in DC. Prodr. 9: 320. 1845; Brand in Engler, Pflanzenr. 4, 250: 20. 1907; Infantes Vera, Lilloa 31: 80. 1962.

Erect, branching shrub to 3 m. tall, glandular-pubescent throughout. Leaves subsessile (occasionally clasping) to short-petioled, elliptic to lanceolate-ovate, acute, sinuate-crenate, cuneate at base or lyrate (rarely auriculate), usually 3–9 cm. long, viscid, densely glandular-pubescent; flowers short-pedicellate, few to many in terminal corymbs; corolla salverform, white, or tube may be yellow with white lobes, 3–4 cm. long and 2.5 cm. across, exceeding the calyx by about 2 cm.; calyx tubular-campanulate, glandular-pubescent, 1.5–2.8 cm. long, lobes narrowly lanceolate, acute, 3-nerved; stamens exserted, exceeding the corolla by 1 cm. or more, inserted near base of tube; ovary oblong-ovoid, glabrous; style exserted, 3.5–5 cm. long; mature capsule oblong, glabrous, to 2.5 cm. long, exceeded by calyx lobes; seeds numerous, brown, winged, the wing usually notched on one side, orbicular or suborbicular, to 3 mm. long.

Amazonas: Prov. Chachapoyas, 2000–2400 m., *Wurdack 575*; 7000 ft., *Sandeman 27*. —Cajamarca: Santa Cruz, *Soukup 4825*. —Piura: Prov. Huancabamba, 2000–2100 m., *Ferreyra 15662*; 2500 m., *Scolnik 1429*. —Without locality: *Mathews 1500, 3047*. Also reported from Ecuador.

COBAEA Cav.

Liana, usually somewhat pubescent. Leaves alternate, pinnately compound, leaflets entire, lateral leaflets broad, short-petioled, the terminal leaflet usually modified as a tendril; flowers solitary on long peduncles in leaf axils; corolla green, greenish-white, yellow, pink, violet or purple (rarely striped), large, campanulate, lobes orbicular to ovate, sometimes caudate; calyx persistent, herbaceous, the 5 sepals divided almost to base, regular; stamens inserted near base of corolla tube, filaments slender, anthers versatile, sometimes appearing sagittate; style included or exserted, stigma 3-lobed or branched; disc 5-lobed; ovary superior, glabrous, elliptic-ovate, tricarpellate, trilocular; mature capsule exceeding calyx, elliptic or elliptic-ovoid, dehiscing septicidally, each locule containing 2 to several large, flat, winged seeds.

Of the 19 described species, only three are known from Peru. The genus ranges from Mexico to Venezuela and in the Andes from Colombia to northern Chile, always in humid, montane forests. *Cobaea scandens* is in cultivation in Europe as well as the Americas; it is variously known in South America as "Enredadera," "Ccoto-ccoto," and "Trinitaria."

Corolla lobes not caudate

Calyx lobes broadly rounded at apex, mucronate.....*C. scandens*

Calyx lobes lanceolate, acute.....*C. campanulata*

Corolla lobes linear-caudate.....*C. penduliflora*

Cobaea campanulata Hemsl. The Garden 17: 352. 1880. *Rosenbergia campanulata* House, Muhlenbergia 4: 24. 1908.

Liana; stems largely glabrous. Leaves subsessile to short-petioled, petioles glabrous or occasionally somewhat pubescent, leaflets entire, glabrous or minutely ciliate, elliptic to obovate, acuminate, the lower pair usually rounded at base, subsessile, others oblique at base with longest cilia often near base, short-petioled, mature leaflest averaging 4–8 cm. long, 2–3 cm. wide; flowers solitary on peduncles 12–18 cm. long; corolla tubular-campanulate, white or yellowish, 4–6 cm. long, exceeding the calyx by 2.5–4 cm., glabrous without, lobes ovate; calyx segments united only at base, sepals linear-lanceolate, acute, long-ciliate; stamens exserted or about equalling the corolla lobes, inserted at a point ca. 1 cm. above base of tube, filaments wooly above point of insertion, pubescence extending down onto the tube; ovary elliptic-ovoid, glabrous, style exserted or included; mature capsule elliptic-ovoid, glabrous, 4–6 cm. long, exceeding calyx lobes by 2–3 cm.; each lobe of disc shallowly bilobate; seeds light brown, ca. 10 mm. long, 6 mm. wide, broadly winged.

Piura: Prov. Ayavaca, valley of Quirós river, 1000–1100 m., *Weberbauer 6425*; 1500 m., *Weberbauer 6397*; Prov. Huancabamba, west of Canchaque, 1200 m., *Stork 11395*. Also reported from Chile.

Cobaea penduliflora (Karst.) Hook. in Bot. Mag. 95: *t. 5757*. 1869; Brand in Engler, Pflanzenr. 4, 250: 28. 1907; Pittier, Bol. Soc. Venez. 3(26): 303–306. 1936. *Rosenbergia penduliflora* Karst., Fl. Columb. Sp. Sel. 1: 27, *t. 14*. 1858. *C. hookeriana* Standl., Contr. U. S. Nat. Herb. 17: 451, *t. 26*. 1914.

Liana, usually somewhat pubescent, at least at stem nodes and on petioles. Leaves sessile or subsessile, the 4–6 petiolulate leaflets,

glaucous, sometimes with scattered pubescence, entire, obovate to elliptic, acute to somewhat acuminate and mucronate, oblique at base, mature leaflets 3–11 cm. long, 2.5–5 cm. wide; flowers solitary on peduncles 20–28 cm. long; corolla greenish, the tube campanulate, said to be 1–5 cm. long, minutely pubescent, the lobes becoming narrowly linear, 4–5 cm. long, 1–2 mm. wide, obtuse at apex or obscurely bilobate; calyx segments united only at base, linear-lanceolate, narrowly apiculate, minutely puberulent, 2.5–3 cm. long, 0.7–0.8 cm. wide; stamens exserted at anthesis, 9–12 cm. long, filaments wooly above point of insertion near base with pubescence extending down onto the tube; ovary ovoid-acuminate, glabrous, style exserted, 10–13 cm. long; mature capsule ovoid-trigonal, glabrous, exceeding calyx, 4.5–5 cm. long; each lobe of disc bilobate; seeds light brown, 2.5–3 cm. long, 1–1.3 cm. wide, emarginate at base, broadly winged.

Although I saw no Peruvian collections, Brand's citation reads: "Ost-Peru: Tarapoto (Spruce n. 4353, Herb. Boissier)." It is certainly to be expected in Peru as it is known from the Andean region of Venezuela and Ecuador.

Cobaea scandens Cav. Icon. Pl. 1: 11, *t. 16, 17.* 1791; Benth. in DC. Prodr. 9: 322. 1845; Brand in Engler, Pflanzenr. 4, 250: 24. 1907. *Rosenbergia scandens* House, Muhlenbergia 3: 23. 1908.

Liana with some scattered pubescence on stem and petioles. Leaves sessile, leaflets entire, glabrous (rarely minutely ciliate), acuminate, the upper two pairs short-petioled, elliptic to obovate, oblique at base, the lower pair usually auriculate, sessile or subsessile, mature leaflets averaging 7–8 cm. long, 3–3.5 cm. wide, but may attain 10 by 5 cm.; flowers solitary on peduncles 15–22 cm. long; corolla campanulate, green, greenish-white, pink, rose, purple, or variously striped, 5–6 cm. long, exceeding calyx by 2.5–3.5 cm., sometimes with scattered pubescence on outside of tube beneath lobes, lobes orbicular to obovate; calyx broadly campanulate, glaucous without but minutely short-pubescent within, the lobes 2.5–3.5 cm. long, 2–3 cm. wide, undulate, mucronate; stamens exserted, filaments wooly above point of insertion near base of tube with pubescence extending down onto tube; ovary elliptic-ovoid, glabrous, style slightly exceeding or about equalling corolla tube; mature capsule elliptic-ovoid, glabrous, 5–7 cm. long, exceeding calyx lobes by 2.5–3 cm.; each lobe of disc deeply bilobate; seeds light brown, ca. 16 mm. long, 10 mm. wide, broadly winged.

Amazonas: Prov. Chachapoyas, Río Utcubamba, 2150–2250 m., *Hutchison & Wright 4915.* —Apurimac: Prov. Apurimac, Abancai,

2300 m., *Soukup 723*; 7500 ft., *Saunders 763*; Prov. Andahuaylas, 2700 m., *Stork & Horton 10773*. —Junín: Prov. Tarma, Lucumayo Valley, 1800–3600 m., *Cook & Gilbert 1377*; Monte Rico La (Merced), *Soukup 3509*; Utcuyacu, 1800 m., *Woytkowski 35385*. Western South America, Venezuela to northern Chile.

GILIA Ruiz & Pavón

Annual, biennial or perennial herbs, usually somewhat pubescent, often glandular. Leaves alternate, entire and linear or pinnately dissected or incised; inflorescences usually cymose, loose cymes or dense heads, or solitary flowers; corolla white, blue, violet, pink or rarely yellow, showy to small and inconspicuous, regular, usually funnelform but sometimes nearly salverform; calyx persistent, accrescent, regular, the 5 sepals united by a hyaline membrane for one-third to one-half their length; stamens inserted on tube, usually slightly unequal in length, exserted or included, anthers oval; style included or only slightly exserted, usually slender with 3 stigmatic branches; ovary elliptic-ovoid to pyriform; mature capsule ovoid, trilocular, dehiscing loculicidally, each locule containing 1–many small brown seeds appearing winged when immature but ovoid to trigonous, without wing, when mature; seeds mucilaginous when wetted.

This extremely heterogenous genus ranges from southern British Columbia through the mountains, southwestern plains and deserts of North America, eastward through Texas to the south Atlantic coast, and recurs in mountains, deserts, and coastal lomas of western South America. Of the 56 reported species, three are known from Peru. A few species have been grown as garden ornamentals.

Stamens inserted in sinuses of corolla lobes

Plants erect, to 20 cm. tall ..... *G. laciniata*

Plants with short central stems, either decumbent or developing decumbent lateral stems

Plants 1–3 cm. tall; leaves pinnately dissected with segments narrowly linear ..... *G. laciniata* var. *alpina*

Plants to 10 cm. tall; leaves irregularly incised, broad ..... *G. lomensis*

Stamens inserted at a point between base of corolla tube and midway of throat ..... *G. glutinosa*

Gilia glutinosa Phil. Linnaea 30: 196. 1859 and Anal. Univ. Chile 90: 212. 1895; Johnston, Contr. Gray Herb. 85: 96. 1929.

G. ramosissima Phil. Cat. Pl. Itin. Tarapacá 53. 1891. *G. glabrata* Phil. Anal. Univ. Chile 90: 213. 1895. *G. ramosissima* var. *glabrata* Reiche, Anal. Univ. Chile 120: 194. 1907 and Fl. Chile 5: 153. 1910. *G. cobijanensis* Brand, Pflanzenr. 4, 250: 98. 1907. *G. chachanensis* Johnston, Contr. Gray Herb. 70: 82. 1924.

Annual or perennial, 5–20 cm. tall, glandular-pubescent, viscid throughout. Leaves narrowly linear, 0.5–1 mm. wide, 0.5–2 cm. long, not more than once dissected; flowers solitary or 2 in leaf axils, on pedicels 1–3 cm. long, corolla 6–12 mm. long, rotate to campanulate, white, blue, violet, or tube white with blue or violet lobes, lobes obtuse to obovate or apiculate; calyx 5–8 mm. long, lobes lanceolate, acute to acuminate; stamens included, filaments inserted near base of corolla to about midway of throat; ovary elliptic-ovoid, glabrous; mature capsule ovoid, glabrous, 5–8 mm. long, equal to or slightly exceeding calyx; each locule containing numerous small, brown seeds.

Arequipa: Prov. Arequipa, *Isern 2138*; Misti Volcano, *Cárdenas & Rodriguez 6*; 2300–2400 m., *Pennell 13055*; 2500 m., *Rauh & Hirsch P569*; 2600 m., *Vargas 7964*; Tingo, 2100–2300 m., *Pennell 13113*; Chachani Mountain, 3300 m., *Hinkley 25*. —Moquegua: Prov. Moquegua, 1900–2000 m., *Weberbauer 7428*. —Tacna: Prov. Tacna, 500–600 m., *Ferreyra 12510, 12526, 12536*.

Gilia laciniata Ruiz & Pavón; Fl. Peruv. 2: 17, *t. 123*. 1799; Benth. in DC. Prodr. 9: 312. 1845; Grant, Aliso 6(2): 73. 1966. *G. erecta* Hieron. Bol. Acad. Nac. Córdoba 3: 368. 1879; *G. laciniata* var. *erecta* Brand, Pflanzenr. 4, 250: 106. 1907. *Thouinia multifida* Dombey ex Juss. Ann. Mus. Paris 3: 119. 1804. *Cantua breviflora* Juss. Ann. Mus. Paris 3: 119. 1804; *C. laciniata* Poir. Lamarck, Encycl. Méth. Bot. Suppl. 2: 81. 1811. *Ipomeria albida* Nutt. Gen. N. Amer. Pl. 1: 125. 1818.

Annuals to 20 cm. tall, erect, glandular-pubescent. Leaves pinnately dissected 1–3 times, 1–5 cm. long, the segments narrowly linear to 2 mm. wide, the mid-section of blade rarely to 4 mm. wide; flowers 1–several in leaf axils on pedicels 0.5–7 mm. long, corolla funnelform, white, pink, lavender or purple, or tube white with colored lobes, lobes obtuse to obovate, tube included in calyx; calyx 6–8 mm. long, lobes lanceolate, acute; stamens usually included but may be short exserted, filaments inserted in sinuses of corolla lobes; ovary elliptic-ovoid, glabrous; mature capsule ovoid, glabrous, 5–7 mm. long, exceeded by calyx lobes, each locule containing numerous small, brown seeds.

Apurimac: Prov. Grau, 3000 m., *Vargas 5728*. —Arequipa: Prov. Arequipa, 2600–2700 m., *Pennell 13190, 13240*; 3355 m., *Hinkley 19*; 8540 ft., *Sandeman 3951, 3999*; Tiabaya, 2100–2200 m., *Pennell 13097*; Río Blanco, 12,000 ft., *Macbride & Featherstone 737*; Prov. Islay, lomas de Mollendo 500–600 m., *Ferreyra 6376*. —Cuzco: Prov. Cuzco, Sicuaní, 13,500 ft., *Stafford 521-A*. —La Libertad: Prov. Trujillo, 550 m., *López M. 1527*. —Lima: Prov. Chancai, Huaura, *Ruiz* (1778–1788); Prov. Lima, Lurín, 200 ft., *Macbride 5964*; San Bartolo, 500–800 ft., *Saunders 166*. —Moquegua: Prov. Moquegua, lomas de Mostacilla, 50–300 m., *Vargas 8595*; Carumas, 3200 m., *Weberbauer 7302*; Torata, 2200–2300 m., *Weberbauer 7400*. —Puno: Prov. Puno, Araranca, 4100–4300 m., *Pennell 13435*.

Gilia laciniata var. **alpina** Weddell, Chlor. And. 2: 81, *t. 58*, 1859. *G. alpina* Brand, Pflanzenr. 4, 250: 107. 1907.

Annuals, 1–3 cm. tall, with short central stems and decumbent lateral stems, more or less glandular-pubescent throughout. Leaves pinnately dissected 1–3 times, 0.5–2.5 cm. long, the segments narrowly linear to 2 mm. wide; flowers 1–several in leaf axils, short pedicillate, corolla funnelform, pink, violet or purple, tube included in calyx; calyx 3–6 mm. long, lobes lanceolate, acute; stamens usually included but may be short exserted, filaments inserted in sinuses of corolla lobes; ovary elliptic-ovoid, glabrous, mature capsule ovoid, glabrous, 3–4 mm. long, exceeded by calyx lobes, each locule containing numerous small, brown seeds.

Junín: Prov. Yauli, 13,500 ft., *Macbride & Featherstone 917*. —Puno: Prov. Puno, Santa Rosa, 13,500 ft., *Stafford 517*; Chuquibambilla, 3850–3900 m., *Pennell 13410*.

Although Dr. Grant[1] placed the variety *alpina* in synonymy with *G. laciniata*, I have returned it to varietal status, not only because of its short, decumbent growth habit but also because its calyces are 3–6 mm. long, whereas those of *G. laciniata* are 6–8 mm. long.

Gilia lomensis Grant, Aliso 6(2): 72, *fig. 4*. 1966.

Annuals to 10 cm. tall, with short central stem and decumbent lateral stems villous to glandular pubescent; leaves of type specimen (garden progeny) irregularly incised, 0.5–2 cm. long, 0.3–1 cm. broad; leaves of specimens cited as representative pinnately dissected, the segments usually narrowly linear, 1–3 cm. long, either entire or incised, rarely broadened to 2 mm.; flowers 1–several in leaf axils, on

[1] Aliso 6(2): 73. 1966.

pedicels 0.5–4 mm. long, corolla funnelform, white or pink, tube included in calyx; calyx 5.5–7.5 mm. long,[1] lobes acute, stamens included or short-exserted, filaments inserted in sinuses of corolla lobes, ovary elliptic-ovoid, glabrous; mature capsule ovoid, glabrous, 5–6 mm. long, exceeded by calyx lobes; each locule containing numerous small, brown seeds.

Arequipa: Prov. Camana, 125 m., *Worth & Morrison 15650.* —Lima: Prov. Chancai, south slope of Cerro, 80 m., *Stork, Beetle & Morrison 9093*; *V. & A. Grant 2244*, TYPE, grown in California from seeds collected on southwestern slope of Cerro San Geronimo by O. Velarde and M. Reiche.

In order to avoid confusion, it should be made clear that the type material, which is garden progeny, differs markedly from the specimens collected in Peru and cited as representative. The garden plant is much larger, more robust, more profusely branched, more decumbent, with broad leaf blades irregularly incised, not pinnately dissected. The leaves of the two small Peruvian specimens show the pinnate dissection typical of *G. laciniata*, although a few leaves display a slight broadening (to 2 mm.) of mid-blade and segment. Of the ten small plants on the two specimen sheets seen, eight were erect and only two showed evidence of developing decumbent lateral stems. Further, slightly broadened leaves were observed on several collections of *G. laciniata*, including two from lomas, *Vargas 8595* and *Ferreyra 6376*; these plants are quite tall and erect, with calyces 7–9 mm. long in fruit. Unusually broad leaf segments occasionally occur on specimens of *G. laciniata* var. *alpina*, i.e., *Stafford 517* and *Pennell 13410*. As these plants are decumbent with mature calyces shorter than those of the typical variety, *G. lomensis* may prove to be even more closely related to the var. *alpina* than to *G. laciniata sens. str.* It would be helpful if we knew how the two latter plants would develop in garden environment. It is hoped that additional collections and continued investigations by such workers as Dr. Grant and his associates will eventually clarify the complex inter-relationships that are apparent in *Gilia*.

HUTHIA Brand

Erect, branching shrubs, the branches cylindrical, glandular-pubescent throughout. Leaves linear-lanceolate to narrowly linear,

[1] According to the original description, length of fruiting calyx is only 6 mm. As a few calyces to 7.5 mm. were seen on the type material, this may indicate a closer relationship with *G. laciniata*.

alternate or fasciculate, always deeply pinnatifid, the segments fleshy, obtuse to obovate, revolute; flowers usually few (sometimes solitary) in terminal or axillary corymbs; corolla blue or violet, tubular or funnelform, two to five times as long as the calyx, apex of corolla lobes obovate-irregular to truncate-erose; calyx persistent, somewhat accrescent, tubular to tubular-campanulate, more or less zygomorphic, 3–5 (6) lobed, the lobes 3-nerved, subulate to acuminate, 2 lobes sometimes more deeply divided than others so that calyx appears sub-bilabiate; stamens included, partly adnate to and inserted on tube at a point one-third to one-half of the corolla length above the base, filaments somewhat dilated at base, pubescent near point of insertion, or papillose-hirsute for entire length, anthers versatile; style included, filiform, stigmas 3-branched; disc irregularly 5-lobed; ovary superior, glabrous, oblong-ovoid, 3-carpellate, 3-locular, with numerous ovules in each locule; mature capsule oblong, glabrous, dehiscing loculicidally by 3 valves, containing 60–80 small, trigonous, narrowly winged seeds.

The genus is obviously very close to *Cantua*, but may be distinguished by its characteristic foliage, blue to violet corolla, and its trigonous seeds which are never more than 2.5 mm. long (the more broadly winged seeds of *Cantua* ranging in length from 3–11 mm.), although these characters hardly seem of generic worth.

Only two species of *Huthia* are known, both reported only from the Department of Arequipa in Peru.

Corolla 2–3 cm. long..... *H. coerulea*
Corolla 4–5.5 cm. long..... *H. longiflora*

Huthia coerulea Brand, Bot. Jahrb. 42: 175. 1908.

Erect, branching shrub to 1 m. tall, glandular-pubescent throughout. Leaves alternate and usually fasciculate, 0.5–3.5 cm. long, 1–6 mm. wide, sessile to short-petioled, linear to linear-lanceolate, deeply pinnatifid, the segments obtuse to obovate, revolute; the uppermost bract-like leaves sometimes entire, or the upper one entire and the lower partly pinnatifid; flowers short-pedicellate, usually few in terminal or axillary corymbs, sometimes solitary in leaf axils; corolla funnelform, blue or blue-violet, glabrous, 2–3 cm. long, usually 2–3 times longer than the calyx, corolla lobes irregularly obovate, almost half the length of the corolla; calyx tubular to tubular-campanulate, glandular-pubescent, 7–12 mm. long, the lobes acuminate; stamens included, inserted on tube at a point about 5–7 mm. above its base, filaments densely papillose-hirsute with longer pubescence

at base; ovary oblong-ovoid, glabrous; style included, 1.5–2.5 cm. long; mature capsule oblong-ovoid, glabrous, 0.5–1 cm. long, exceeded by the calyx lobes; seeds numerous, brown, narrowly winged, trigonous, to 2.5 mm. long.

Arequipa: On slopes of Misti Volcano, *Cárdenas & Rodriguez 4*; 8300 ft., *Saunders 345*; 9000 ft., *Sandeman 3754*; arid plains, over 3200 m., *West 7139*; on Mt. Chiwata, 2200 m., *Eyerdam & Beetle 22110*; cerros de Arequipa, 2350 m., *Ferreyra 2576*; 8000 ft., *Stafford D-8.*

Huthia longiflora Brand, Bot. Jahrb. 50, Beibl. 111: 51. 1913.

Erect, branching shrub to 1 m. tall, densely glandular-puberulent, canescent. Leaves alternate, often fasciculate, sessile to short-petioled, narrowly linear, pinnatisect, 1–20 mm. long, 1–3 mm. wide, the short segments rounded, revolute; flowers long-pedicillate, solitary or few in lax, terminal corymbs; corolla tubular, violet, glabrous, 4–5.5 cm. long, 3–5 times longer than the calyx, corolla lobes obtuse to truncate and erose, 1–1.5 cm. long; calyx tubular, glandular-pubescent, 1–1.5 cm. long, the lobes lanceolate, subulate to acuminate; stamens included or equalling the corolla length, glabrous except becoming wooly near point of insertion, about 1 cm. above base of tube; ovary oblong-ovoid, glabrous; style about equalling corolla length; mature capsule pyriform to oblong, glabrous, 7–10 mm. long, exceeded by calyx lobes; seeds numerous, brown, trigonous, narrowly winged, to 2.5 mm. long.

Arequipa: Near confluence of Río de Lomas and Río Yauca, 1900–2000 m., *Weberbauer 5752.*

PHLOX L.

Erect, branching, diffuse or caespitose perennials or annuals, herbaceous to suffrutescent (not in ours). Leaves entire, usually opposite, sessile to petioled; flowers in terminal corymbs or cymes or in pairs in leaf axils (rarely solitary); corolla salverform, tube slender and throat usually constricted, often showy but may be inconspicuous, red, purplish, blue, cream or white; calyx tubular or campanulate, 5-lobed, persistent, accrescent, the lobes acute to acuminate, with a membrane below the sinuses; stamens short, included, unequally inserted; style usually slender, stigmas 3-branched or lobed; ovary superior, 3-loculed, ovoid to oblong; mature capsule ovoid to oblong, dehiscing loculicidally, seeds oblong, 1–few in each locule.

The genus ranges throughout temperate North America and northern Asia, but only one species, *Phlox gracilis*, is known from South America. There are certain differences between this polymorphic species and most of the remaining species of *Phlox* (*P. gracilis* has a smaller corolla with slightly flaring base, and seeds that become somewhat mucilaginous when wetted), which to some botanists justify its segregation as a minor genus *Microsteris*.[1] However, I agree with Mason[2] that the differences are minor and that its relationship within the family is more clearly shown by including it in *Phlox*.

Phlox gracilis (Dougl. ex Hook.) Greene, Pittonia 1: 141. 1887. *Gilia gracilis* (Dougl.) Hook. Bot. Mag. 56: *t. 2924*. 1829; Brand in Engler, Pflanzenr. 4, 250: 88. 1907. *G. gracilis* (Dougl.) Hook. ssp. *eu-gracilis* Brand and varieties *stricta* (Greene) Brand, *eritrichoides* (Griseb.) Brand, *glabella* (Greene) Brand, *micrantha* (Kellogg) Brand, and subsp. *humilis* (Dougl.) Brand, l.c. 89–91. *G. gracilis* var. *minuartioides* (Franchet) Borsine, Lilloa 8: 212. 1942. *Collomia gracilis* (Dougl.) Lindley, Bot. Reg. 19: *t. 1622*. 1833 and DC. Prodr. 9: 308. 1845. *C. gracilis* var. *congesta* Wedd., Chlor. And. 2: 80, *pl. 58-A*. 1859; *C. gracilis* var. *andicola* Wedd., l.c. *C. micrantha* Kellogg, Proc. Calif. Acad. 3: 18. 1863. *C. eritrichoides* Griseb. Abh. Königl. Ges. Wissensch. Göttengen 6: 129. 1854. *Navarretia gracilis* (Dougl. ex Hook.) Kuntze, Rev. Gen. Pl. 1: 433. 1891. *Microsteris gracilis* (Hook.) Greene, Pittonia 3: 300. 1898. *M. gracilis* ssp. *humilis* (Greene) V. Grant in Munz, A California Flora 478. 1959. *M. humilis* (Dougl.) Greene, Pittonia 3: 301. 1898. *M. micrantha* (Kell.) Greene, l.c. 303. *Polemonium morenonis* O. Ktze. Rev. Gen. Pl. 3(2): 203. 1898.

Small, branching annual, more or less glandular-pubescent throughout, diffuse or erect, 1–12 cm. tall. Leaves entire, linear or linear-oblong to oblanceolate or spatulate, 1–3 cm. long, predominantly opposite (the lower always opposite, only the uppermost alternate), sessile to short-petioled; flowers usually in pairs (rarely 1 or 3) in leaf axils; corolla salverform, 5–12 mm. long (usually less than 8 mm.), the tube white or cream, the lobes bilobate, white, cream, rose, lavender or purple, exceeding the calyx lobes by only 1–3 mm.; calyx 4–

[1] Wherry, Edgar T. Brittonia 5(1): 60–63. 1943; "The Genus Phlox" in Morris Arb. Monogr. 3: 1–174. 1955.

Grant, Verne E. Natural History of the Phlox Family, Vol. 1: 43, 46, 63, 77. 1959.

[2] Mason, H. L. Madroño 6: 122–177. 1941; Madroño 10: 202–203. 1950.

10 mm. long, cylindrical, the lobes herbaceous, subequal, 3-nerved, acute, united by a hyaline membrane, the lobes equalling or longer than the tube; stamens included, the short filaments partly adnate to and unequally inserted on the tube at a point a little above the middle, anthers sagittate; style included, slender; ovary glabrous, ovoid; mature capsule glabrous, ovoid, rupturing the calyx in age, each locule containing 1 brown, lenticular seed, the seeds becoming somewhat mucilaginous when wetted.

Plants with a small corolla (5–8 mm. long) were first thought to be ssp. *humilis* (Greene) V. Grant. However, the corollas of all those examined from Peru were well exserted, and the larger ones (8–12 mm.) were often only barely exserted.

Arequipa: Arequipa, 3000–3200 m., *Pennell 13232*; Chachani, 11,000 ft., *Stafford 618*; Prov. Condesuyos, between Chuquibamba and Salamanca, 4000 m., *Weberbauer 6851*. —Cuzco: Prov. Anta, Río Blanco, 15,000 ft., *Macbride & Featherstone 815*. —Huanuco: Huillacachi, Matucana, 3300 m., *Weberbauer 5725*. —Puno: Prov. Sandía, *Hill* (Jan.–March, 1903). Also in Bolivia, Chile and Argentina.

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